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#### 4. OBSERVATIONS ON CONFLICT AMONG MALES OF BLACK RAT *RATTUS RATTUS FRUGIVORUS*

Incidence of mortality in conflict among males of black rat *Rattus rattus* L. is supposedly very low (Barnett 1958). Evidence presented herein, however, suggests that in sub-species *Rattus rattus frugivorus* deaths in such interactions may not be unusual in some situations.

## OBSERVATIONS

(1) In aggressive rodents caught together males often fight until one is killed by the time traps are collected (Spillett 1968). The same was observed twice in a total of 132 trappings with multiple-catch wonder traps. An apparently senile male with grey hairs and pathological testis (weight 218 gm) was killed in the trap by a younger male (wt. 192 gm) while on another occasion a healthy male (wt. 146 gm) was found to have died in a fight with one of its own age (wt. 152 gm). This

TABLE 1

Colony	Weight of resident <i>alpha</i> gm	Weight of interloper gm	Mortality in days	Final weight of interloper	Wounding
Bisexual	160	146	0.08	143	Superficial
		166	1	162	Superficial
		122	2	114	Superficial
		117	3	108	Testis & viscera pulled out
Bisexual	190	200	1	194	Superficial
		180	1	176	Superficial
		157	5	143	Superficial
		135	6	105	Superficial
		106	1	101	Superficial
		70	2	-	Testis & viscera pulled out
Bisexual	192	212	1	201	Superficial
	156	160	0.12	158	Superficial
	142	117	3	102	Superficial
	175	130	5	113	Superficial
	196	119	3	107	Superficial
		132	-	-	Superficial
		172	-	-	Superficial

\* Housed in cages. All others in pen.

reflects that such mortality among males is not unusual in natural environment.

(2) High rate of mortality was recorded for males released in bisexual colonies maintained in pens ( $9 \times 5 \times 4'$ ). Mature males of good condition were killed by the resident males sooner than weaker ones which wasted away over a period of several days (Table 1). One resident male killed all the six females introduced into its pen. Its behaviour was consequently adjudged as atypical. It was also killed on being released in another colony.

Agnostic interactions in pens were not quantitatively evaluated but there was apparently much jumping and chasing before the interloper was caught by the residents. To escape pursuit the rats often waded into drinking water kept in a tray. Recovered later, when dead, they were often found wet with swollen feet. Body injuries otherwise were superficial except in case of two young males (wts. 70 & 117 gm) whose testes and viscera were pulled out.

(3) 12 interlopers were released in as many bisexual colonies housed in cages ( $32 \times 18 \times 18''$ ). Only two males died after six days while the rest survived the period of observation extending to three weeks. Threatened by resident males, the interlopers invariably hung to the side or roof of the cage. When chased they ran and jumped frantically disturbing the nest box, water tray and also the females in the process. This seemed to 'displace' the aggressive drive of the resident males. The interlopers were thus not pursued with vigour and the survivors accordingly did not show any serious injury. The fur coat was, however, generally thin.

(4) Likewise only a few interlopers were killed in all-male colonies. Their introduction invariably triggered a general fight in the colony which was surmised as the absence of social stability in it. It was clear thus that the interlopers were released before any one male and established its social ascendancy.

(5) A number of males were introduced into cages housing a lone male. None of the interloper was killed in the following eight days. But the condition of some of them had apparently deteriorated. Had the period of observation been extended some deaths might have been recorded. This, however, could not be done.

Individual weights of all the interlopers were compared to that recorded later at the time of autopsy. Maximum decrease in weight (10 to 20%) was shown by the rats which appeared to have wasted away after release. The loss of weight in case of other rats killed as also of the survivors was only marginal.

#### DISCUSSION

The slender and lightly built black rats climb well. Simulated labo-

ratory facilities for studying their agnostic behaviour needs to be spacious with even surfaces to ensure perpetual contact between the combatants. This was possible in the pens but not quite so in the cages. This may have created the difference in mortality recorded for the same situations in the two set ups.

Resident males attacked the interlopers in all situations to defend their territory against strange males. The intensity of attack on them was particularly heightened by the presence of females. Thus the incidence of male mortality recorded in bisexual colonies housed in pens equalled that reported for more aggressive species as *Rattus norvegicus* (Barnett 1958; *et al.* 1968). Otherwise it was comparatively insignificant.

The interlopers which lost weight rapidly and died slowly in pens and cages can be classified as the 'omega' males (Barnett 1958). Accordingly others able to maintain their weights in cages or killed with marginal loss of it in pens were the 'beta' males. Thus males of this species are also stratified in three social ranks—dominant alphas (residents) and the sub-ordinate betas and omegas. The distinctions between them, however, may not be very sharp like that noted among males of brown rat *Rattus norvegicus* (Barnett 1958).

Death of the residents following successive fights with interlopers shows that the general capacity of the males of this species to tolerate stress of agnostic interactions is very limited. Implied in this are some general facts about the aggressive behaviour of this species e.g. (1) it is less aggressive, (2) any one male fails to dominate several others, as in all-male colony and (3) that it restricts the size of social units. Only a few males thus may succeed in co-existing and the number of females associating with them would obviously depend on their ability to cover them. In any case then the total number of rats in the colony would be limited.

Apparently the behaviour of the species requires analysis in detail. This is being attempted in my laboratory.

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